REMARKS

Applicant thanks Examiner Kwok for her careful attention to this application. The claims have been renumbered in accordance with the Examiner's instructions.

I. Anticipation of Claims 1-6, 8-12, 17-18, 20-42, 44-46, and 57-58

Claims 1-6, 8-12, 17-18, 20-42, 44-46, and 57-58 were rejected as anticipated by U.S. Patent 6,305,221 (Hutchins) or U.S. Patent 5,255,565 (Judd et al.) or U.S. Patent 6,615,132 (Horton et al.).

Claim 1

Claim 1 as amended requires among other things:

> an angular rate filter coupled between the angular rate sensor and the processor for allowing only angular rate sensor outputs within a frequency range to reach the processor.

The angular rate filter allows the processor to manipulate only outputs from the angular rate sensor with a specific frequency band. Thus, the processor does not need to process each output from the angular rate sensor, thereby reducing the amount of time the processor is active, and thus reducing the power consumption by the processor.

Hutchins, Judd et al. or Horton et al. do not show or suggest such a system.

1. Hutchins

Hutchins says:

> The output terminals of units 48, 49, and 50 are coupled to input terminals of a processor 52 and analog filters 53. The filters may be employed to remove high frequency signals that interfere with accuracy. In addition, the linear accelerometer signals may be separated into six channels: three low passed filtered at a range, say 40 Hz, to remove high frequency noise, and three low pass

> filtered at a range, say 1 Hz, to provide a signal that is commensurate with tilt of the device. This results in a twelve degree of freedom system. Processor 52 may be employed to make the calculations necessary to control the removal of instrument constants from the signals and to direct them to the analog to digital converter 54. In accordance with another embodiment of the invention, processor 52 may process the analog signals for calculating equations 23-25 and 49-50.

Col. 23, lines 41-55.

The output of the angular accelerators are coupled first to *both* the inputs of the filters 53 AND a processor 52. Further, it says specifically that the filters remove only the high frequency signals. The patent mentions the use of a low pass filter only for the linear accelerometers and to provide additional inputs to processor 52.

Thus, the Hutchins patent teaches away from what is claimed. Hutchins teaches to provide many different sources of movement information to the processor, and then to let the processor determine the information which is or is not of interest.

2. Judd et al.

The Judd et al. patent shows a series of anti-aliasing filters. However, these filters remove frequencies above a predetermined frequency. Col. 5, line 57-58. The application states, "Each sensor is connected to a corresponding anti-aliasing filter which removes substantially all frequency components of the raw data signal above a selected cutoff frequency, f_{co}, which is the maximum frequency of interest." Col. 2, lines 33-38.

3. Horton et al.

The Horton et al. patent does not show *any* angular rate sensors. The patent shows only the use of linear accelerometers. Col. 3, lines 26-30. Horton therefore does not show the elements of the claimed invention.

Thus, Hutching, Judd et al., and Horton et al. do now show the invention of claims 1-6; 8-12; 17-18; 20-42; 44-46; and 57-58.

Claim 2

Claim 2 requires a comparing means for comparing the angular rate sensor output with an angular rate threshold. Neither Hutching or Judd et al. shows any such comparing means.

Claim 3

Claim 3 requires a storing means for storing the angular rate sensor output in the memory if the angular rate sensor output is greater than the angular rate threshold. While Judd et al. stores the output of the angular rate sensor in a memory, it does so without reference to whether the output exceeds a threshold. Col. 9, lines 36.

Hutchings says that the values of distance traversed and speed may be stored in a memory. Col. 25, line 3. This is not the same as storing the output of the angular rate sensor.

Claim 4

Claim 4 is similar to claim 3 except it requires that the processor is configured to store the angular rate sensor output in the memory if the angular rate sensor output is greater than the angular rate threshold. Again, as stated as to claim 3, this element is not shown in Judd et al. or Hutchings.

Claims 5, 6, 8, 9 & 10

Claims 5, 6, 8, 9 & 10 are depend ultimately upon claim 4, and thus are allowable for the reasons stated above.

Claim 11 & 12

Claim 11 requires a comparator for comparing the linear accelerometer output with a linear acceleration threshold. Claim 12 depends upon claim 11, and requires that the processor is configured to store the linear accelerometer output in the memory if the linear accelerometer output exceeds the linear acceleration threshold.

As state previously, Judd et al. stores all outputs in memory without comparing to a linear acceleration threshold. There is no disclosure in Hutchings of any storage of the outputs in a memory.

Claim 17

Claim 17 requires a first linear accelerometer filter for allowing the first linear accelerometer output to reach the processor if the first linear accelerometer output is within a first frequency range and a first angular rate sensor filter for allowing the first angular rate sensor output to reach the processor if the first angular rate sensor output is within a second frequency range.

As stated above, Hutchings says that the filters only remove high frequency signals. Col. 23, lines 42-45. It says that the linear accelerometer outputs may be divided into six channels where three are low passed filtered while three are high pass filtered. Col. 23, lines 44-48. Thus, Hutchings does not show the claimed elements of claim 17.

Judd et al. shows only high pass filtering.

Claim 18

Claim 18 says that the first frequency range and the second frequency range are programmable by the processor. This is not shown or suggested by Hutchings or Judd et al. Neither show the filters capable of programming by the processor.

Claim 20

Claim 20 is dependent upon claim 18 and is therefore allowable.

Claims 21

Claim 21 includes a roll filter coupled between the roll angular rate sensor and the processor to allow the roll filter output to reach the processor only if the roll filter output is within a frequency range; a pitch filter coupled between the pitch angular rate sensor and the processor to allow the pitch filter output to reach the processor only if the pitch filter output is within the frequency range; and a yaw filter coupled between the yaw angular rate sensor and the processor to allow the yaw filter output to reach the processor only if the yaw filter output is within the frequency range.

Hutchings shows a filter to remove high frequency signals. Col. 23, lines 42-44. It does not show a bandpass filter. Similarly, Judd et al. shows anti-aliasing filters to remove frequencies above a predetermined level. Col. 5, lines 56-58.

Further, the references do not show a system where the accelerometer outputs are stored in memory if the outputs exceed a threshold. In Judd et al., the outputs are always stored in memory. In Hutchings, there is no indication of a memory for storing the accelerometer outputs.

Therefore, neither reference anticipates this claim.

Claim 22

Claim 22 requires the use of a time stamp. The cited references do not show or suggest the use of a time stamp.

Claims 23 & 24

Claims 23 & 24 depend from claim 22. Because claim 22 is not anticipated by the references, neither are these claims.

Claim 25

Claim 25 is a method claim requiring, among other things, comparing the angular rate sensor output with a threshold and, if the angular rate sensor output is greater than the threshold, storing a plurality of angular rate sensor outputs in the memory.

As stated previously, Judd et al and Hutchings show only the continuous storing of outputs from the angular rate sensors without comparison to a threshold.

Further, claim 25 requires that an angular rate filter allow only the angular rate output to reach the processor if the angular rate output is within a frequency range. This is also not shown in Judd et al. or Hutchings.

Therefore, claim 25 is not anticipated by the cited references.

Claim 26

Claim 26 requires the storing of angular sensor date stamps with the plurality of angular rate sensor outputs. Neither reference shows the use of date stamps.

Claim 27

Claim 27 says that the plurality of angular rate sensor outputs in the memory if the angular rate sensor output falls below the threshold. Neither reference shows the use of a threshold to determine whether to store the angular rate sensor output.

Claim 28

Claim 28 includes the requirement that the storing of the plurality of angular rate sensor outputs in the memory ends if the angular rate sensor output exceeds a predetermined time limit. Neither reference shows this step.

Claims 29

Claim 29 says that, if a predetermined time limit is exceeded, the storing of further outputs from the memory is also stopped for a period of time. This is not shown in the references.

Claim 30

Claim 30 requires storing a plurality of linear accelerometer outputs if the linear accelerometer output exceeds a threshold. Neither references shows this step.

Claim 31

Claim 31 requires ceasing the storing of the plurality of linear acceleration outputs in the memory if the linear acceleration output falls below the linear accelerometer threshold. This is also not shown by the references.

Claim 32

Claim 32 adds the step of ceasing the storing of the plurality of linear accelerometer outputs in the memory if the storing of the plurality of linear accelerometer outputs exceeds a second time limit. The references do not show this step.

Claim 33

Claim 33 adds the step of stopping the storing of the plurality of linear accelerometer outputs for a second period of time if the storing of the plurality of linear accelerometer outputs exceeds the second time limit. This is also not shown in the references.

Claim 34

Claim 34 includes the step of recalibrating the linear accelerometer after ceasing the storing of the plurality of the linear acceleration outputs. This is not shown in the references.

Claim 35

Claim 35 requires three angular rate sensors and three filters coupled to the angular rate sensor filters. The angular rate sensor filters allow the output of the angular rate sensors to reach the processor only if the output is within a range of frequencies.

Hutchings shows a filter which allows only signals below a threshold frequency. Col. 23, lines 43-45. Judd et al. shows anti-aliasing filters for removing frequencies above a frequency. Col. 5, lines 56-58. Therefore, these references do not anticipate the claimed invention.

Claims 36, 37 & 38

Claims 36, 37 and 38 are allowable because they depends from claim 35.

Claim 39

Claim 39 includes the use of a clock for generating a time stamp. Neither Hutchings nor Judd et al. shows the use of a clock to generate a time stamp.

Claim 40

Claim 40 requires the storing of the linear accelerometer and angular rate sensor outputs in a memory. Hutchings does not show a memory for storing the outputs. Judd et al. does indicate that the outputs Neither of the references show a memory to store the outputs of the various sensors.

Claim 41

Claim 41 says that the outputs are stored in memory when a threshold is exceeded. Further, neither reference shows storing of the outputs when a threshold is exceeded.

Claim 42

Claim 42 says that the outputs are stored only if one of the outputs exceeds a threshold.

Claim 44

Claim 44 requires that the storing of outputs occurs stops after a period of time. This is not shown in Judd et al.

Claim 45

Claim 45 requires the computation of a velocity change. This claim is allowable because it depends from claim 44.

Claim 46

Claim 46 requires the determination a peak linear accelerometer value. This claim is allowable because it depends from claim 45.

Claim 57

Claim 57 says that the angular rate sensor is programmable. No mention is made in the references that the angular rate sensors are programmable.

Claim 58

Claim 58 says that the angular rate sensor is programmable by the processor. This is also not shown in the references.

II. Obviousness of Claims 13-16 and 47-49.

Claims 13-16 and 47-49 are allowable because the claims upon which they are based are not anticipated by the references cited by the Examiner.

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CONCLUSION

In conclusion, the subject application is now in condition for allowance and an action acknowledging the same is respectfully requested. If after reviewing this Amendment, should the Examiner have questions or require additional information, the Examiner is cordially invited to call the undersigned attorney so this case may receive an early Notice of Allowance. Such action is earnestly solicited.

Respectfully submitted,

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